

**HUNDRED AND SIXTH REPORT
PUBLIC ACCOUNTS COMMITTEE
(1981-82)**

**UNDER-UTILISATION OF PRODUCTION CAPACITY
OF AN ORDNANCE FACTORY**

DEPARTMENT OF DEFENCE PRODUCTION



Presented in Lok Sabha on 30-4-1982

Laid in Rajya Sabha on 30-4-1982

**LOK SABHA SECRETARIAT
NEW DELHI**

April, 1982/Vaisakha, 1904 (S)

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PART II*

Minutes of the Public Accounts Committee (1981-82) held on :

10-12-81 (AN)

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(1981-82)

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INTRODUCTION

I, the Chairman of the Public Accounts Committee as authorised by the Committee, do present on their behalf this Hundred and Sixth Report on paragraph 11 of the Report of the Comptroller and Auditor General of India for the year 1979-80, Union Government (Defence Services) regarding under-utilisation of production capacity of an ordnance factory.

2. The Report of the Comptroller and Auditor General of India for the year 1979-80, Union Government (Defence Services) was laid on the Table of the House on 28 April, 1981. The Public Accounts Committee (1981-82) examined the Audit Paragraph at their sitting held on 10 December, 1981. The Committee considered and finalised this Report at their sitting held on 23 April, 1982. Minutes of these sittings of the Committee form Part II* of the Report.

3. In this Report, the Committee have expressed concern over the continued under-utilisation of the production capacity in various plants of the Ordnance Factory, Bhandara which manufactures various types of explosives for the army. The factory is a typical example of a defence production unit continuing to function on the basis of outdated technology and with obsolete plant and equipment. In order to keep pace with the growing requirements of sophisticated arms, ammunition and other equipment, a perspective plan needs to be prepared for replacement of old plant and equipment in the ordnance factories with modern ones based on latest technology.

4. For reference facility and convenience, the observations and recommendations of the Committee have been printed in thick type in the body of the Report and have also been reproduced in a consolidated form in Appendix II to the Report.

5. The Committee place on record their appreciation of the assistance rendered to them in the examination of the subject by the Office of the Comptroller and Auditor General of India.

6. The Committee would also like to express their thanks to the Officers of the Department of Defence Production for the cooperation extended by them in giving information to the Committee.

NEW DELHI;

April 24, 1982

Vaisakha 4, 1904(S)

SATISH AGARWAL
Chairman
Public Accounts Committee.

*Not printed (one cyclostyled copy laid on the Table of the House and five copies placed in Parliament Library).

REPORT

UNDER-UTILISATION OF PRODUCTION CAPACITY OF AN ORDNANCE FACTORY

Audit Paragraph

1.1 Mention was made in paragraph 4 of the Report of the Comptroller and Auditor General of India for the year 1970-71, Union Government (Defence Services) regarding the unsatisfactory performance of an ordnance factory in the manufacture of certain types of explosives, delay in the commissioning and under utilisation of various plants. The Public Accounts Committee (PAC) (5th Lok Sabha : 1972-73) in its 92nd Report had, *inter alia*, recommended that :

- the cost of production of process material 'X' required for the manufacture of explosive 'A' should be progressively brought down;
- there should be no delay in establishing the required variety of explosive 'B' for a particular ammunition after 1974; and
- the process material plant for explosive 'C' should be fully utilised to meet the requirements of the factory as well as civil trade.

1.2 A review in audit (February 1980) of the performance of the factory in the light of above recommendations of the PAC disclosed the following points :

(i) Explosive 'A'—The annual installed capacity of the second hand plant for the manufacture of explosive 'A', which was originally fixed at 984 tonnes, was refixed at 804 tonnes subsequent to the guarantee run (1969-70) as agreed to by the supplier. The realisable capacity was, however, determined at 660 tonnes only. The Ordnance Factory Board (OFB) stated (October 1980) that the plant having further deteriorated due to continuous working, a production capacity of 480 tonnes per annum was considered practicable even though it was trying to achieve a production of 600 tonnes per annum. During the six years from 1974-75 to 1979-80, the actual production was 158 tonnes (1974-75), 401 tonnes (1975-76), 319 tonnes (1976-77), 600 tonnes (1977-78), 506 tonnes (1978-79) and 515 tonnes (1979-80). The OFB stated (October 1980) that the shortfall was due to restricted supply of sulphur acid shortage of storage space breakdown in plant and unforeseen repairs to equipment, non-availability of process material 'X', etc.

The shortfall in production of explosive 'A' was made up through import of 645 tonnes (cost : Rs. 2.48 crores) during August 1977—May 1979 and received during December 1978 to April 1980. A further quantity of 950 tonnes indented by the OFB in January 1980 for import (estimated cost : Rs. 4.087 crores) was ordered in March-April 1980, of which 400 tonnes were received till October 1980.

(ii) The production of explosive 'A' entailed manufacture of process material 'X' from process material 'Y' which in turn was to be manufactured from a basic raw material. For the manufacture of process material 'X', as against the capacity of 32.6 tonnes per month demonstrated by the foreign

technicians by using indigenous material, the achievable capacity was indicated on the basis of experimental trials conducted in August-September 1975 as 9.74 tonnes per month (117 tonnes per annum) which would produce 160 tonnes of explosive 'A' per annum. As the cost of production of material 'X' (about Rs. 79,692 per tonne on average during 1974-75 to 1977-78) was much higher than that, at which it was available abroad, (about Rs. 8,356 per tonne on average during the corresponding period) where it was produced by a different process, and as there was scarcity of basic raw material, the Ministry informed the PAC (1972-73) that pending technical studies on the plant to achieve higher yield and efficiency, the plant would be run at a low level consistent with the availability of basic raw material. Details of the quantities of explosive 'A' and the process material 'X' manufactured during 1974-75 to 1979-80 giving break-up of the quantities of explosive 'A' manufactured out of process material 'X' produced in the factory and out of imported material 'X' together with corresponding year-wise costs of production are given below :

Year	Total quantity of explosive 'A' manufactured	Quantity of explosive 'A' produced		Unit cost of explosive 'A'		Total quantity of material 'X' produced in factory (Tonnes)	Cost of material 'X' produced in factory (Rs. per tonne)	Average cost of imported material 'X' (Rs. per tonne)
		with factory material 'X' (Tonnes)	with imported material 'X' (Tonnes)	when factory material 'X' was used (Rs. per tonne)	When imported material was used (Rs. per tonne)			
1	2	3	4	5	6	7	8	9
1974-75	158	20	138	91,334	33,712	33	79,518	4,069
1975-76	401	50	351	91,980	43,301	22	77,360	11,114
1976-77	319	41	278	96,401	39,619	19	76,657	10,391
1977-78	600	14	586	98,938	44,265	12	85,932	7,851
1978-79	505	Nil	505	Nil	55,453	Nil	Nil	No receipt
1979-80	515	Nil	515	Nil	52,345	Nil	Nil	11,777

A total quantity of 1,938.15 tonnes of process material 'X' (cost : Rs. 179.84 lakhs) was imported by the factory against indents for 2,259 tonnes from 1974-75 to 1979-80. A further quantity of 355 tonnes was also indented by the OFB in June 1980 for import (estimated cost : Rs. 29.43 lakhs) and it was yet to be ordered (October 1980).

(iii) Instead of production from process material 'X', 26.70 tonnes of an intermediate product were obtained (March 1979) by the factory from a public sector undertaking at an estimated cost of Rs. 5.34 lakhs and the entire quantity was converted to explosive 'A'. However, further attempts to obtain the intermediate product from the public sector undertaking were not successful as they were having problems in the plant, thus leaving no alternative to the OFB but to import material 'X'.

(iv) The imported plant costing Rs. 45.91 lakhs and designed to produce 4,584 tonnes of material 'Y' per annum (achievable capacity assessed as 3,780 tonnes per annum) was not fully utilised and the process material actually produced was 561 tonnes in 1974-75, 274 tonnes in 1975-76, 451

tonnes in 1976-77, nil in 1977-78, 43 tonnes in 1978-79 and 66 tonnes in 1979-80. The shortfall was attributed (October 1980) to limited availability of basic raw material.

1.3 Explosive 'B'—Against the annual installed capacity of 81 tonnes in terms of a single variety of propellant, the realisable capacity computed for a product mix of 4 different types of propellants for which the plant was designed was assessed as 720 tonnes only including 60 tonnes earmarked for Research and Development (R&D) establishment. The actual production against production programme expressed in terms of a single component was 264.51 tonnes (1974-75), 337.83 tonnes (1975-76), 442.46 tonnes (1976-77), 424.47 tonnes (1977-78), 400.42 tonnes (1978-79) and 335.51 tonnes (1979-80). According to the OFB (October 1980), full requirements of these 4 varieties of propellants were met for production of explosive 'B'.

In paragraph 2.63 of 92nd Report of the PAC (5th Lok Sabha : 1972-73), it was mentioned that the above capacity could be fully utilised provided the factory could produce a different variety of explosive 'B' which would require a small addition of another explosive to be produced in another plant planned to be set up as an internal part of the rocket and propellant project for manufacture of a highly sensitive substance. Even though this plant was commissioned in the factory in January 1975, production of the specified variety of explosive 'B' for the development of which Rs. 4.13 lakhs had already been spent up to 1979-80, could not be established using the technology and equipment available in the factory.

Thus, 1,579 tonnes of the specified variety of explosive had to be ordered for import by another factory; against this, 1,206,045 tonnes (cost : Rs. 455.50 lakhs) were imported during 1974-75 to 1980-81 (October 1980). A further quantity of 292 tonnes (estimated cost : Rs. 2.02 crores) had been indented by the OFB in May 1980 and it was yet to be ordered (October 1980) for import which was to be continued till a suitable production potential for the manufacture of this variety of explosive was built up in the country.

1.4 Process material 'H'—(i) The realisable capacity of process material 'H' had been assessed at 1,284 tonnes as against the annual installed capacity of 1,308 tonnes. The actual production was 352 tonnes (1974-75), 192 tonnes (1975-76), 156 tonnes (1976-77), 325 tonnes (1977-78), 257 tonnes (1978-79) and 249 tonnes (1979-80). The OFB stated (October 1980) that the shortfall was due to restricted production to keep pace with the requirement of finished explosive as per production programme and the demand of supply of the item to the civil trade being low from 1976-77 because of additional production capacity for the item having been set up in the private sector whose prices were also lower.

(ii) Besides, acid plants had also remained under-utilised, the utilisation during 1974-75 to 1979-80 varying from 24.2 to 56.8 per cent for nitric acid plant, 32.2 to 59.9 per cent for nitric acid concentrating plant and 14.6 to 30.7 per cent for sulphuric acid concentrating plant. Despite marketing of acids to civil trade, the low out-turn had been attributed to matching of production in the ancillary process plants with the requirement for finished item of explosive.

1.5 A project for the creation of additional capacity for production of 1,200 tonnes per annum of rocket propellants and ballistites was also sanc-

tioned (May 1969) at an estimated cost of Rs. 17.14 crores, which was increased (April 1972) to Rs. 20.034 crores. The project was to be completed within 4 to 5 years from the time of sanction.

The civil works were completed between October 1972 and March 1976. The contract for import of 5 plants and for the supply of technical documentation at a total cost of Rs. 421.74 lakhs was concluded in February 1970 with a foreign firm. Contracts for the supply of the remaining 5 ancillary plants (cost : Rs. 300.73 lakhs) were concluded between April 1971 and June 1971. The plants erected/commissioned were taken over by the factory between January 1975 and December 1976 against the target date of May 1974. The delay in taking over all the plants had been attributed to delay in completing the guarantee run for one plant due to :

- change of specification of one item mutually agreed to in January 1976;
- replacement of an item originally included for guarantee run by a new product resulting in considerable trial, development work and subsequent test and analysis both in the foreign country and at the factory; and
- failure of one of the lots of the above item in ballistic test necessitating the collaborator's representatives conducting certain trials in their country completed in December 1976.

One out of 2 units of ancillary plant procured for producing the highly sensitive substance under the project, exploded in May 1975 during commissioning trials and the whole plant and building including certain material (cost : Rs. 28.60 lakhs) were destroyed. A board of enquiry held immediately could not identify the cause of the accident. A fresh contract was concluded (May 1976) for the plant at a cost of Rs. 15 lakhs and it was commissioned in April 1979 (cost : Rs. 21.05 lakhs). Reconstruction of the building was sanctioned by the DGOF (November 1977) at a cost of Rs. 3.41 lakhs and completed in November 1979.

1.6 Orders were placed for the development of 6 items of rocket propellants and 4 items of ballistites at an estimated cost of Rs. 1.02 crores. Out of these, 2 items of rocket propellants and all items of ballistites were established in 1975-76 and 1976-77. In addition 1 item of rocket propellant was developed in 1976-77. The development expenditure incurred thereon was Rs. 1.04 crores (February 1980). For the development of other items, which were yet to be established, an expenditure of Rs. 20.32 lakhs had been incurred (February 1980). Out of the installed capacity of 720 tonnes for the propellants and 480 tonnes of ballistites, the actual quantities manufactured and the percentage utilisation of capacities during the four years from 1976-77 to 1979-80 were as under :

Year	Propellants		Ballistites	
	Quantity produced	Percentage of capacity utilised	Quantity produced	Percentage of capacity utilised
	(in tonnes)		(in tonnes)	
1976-77	23	3.2	44	9.2
1977-78	18	2.5	185	38.5
1978-79	30	4.1	126	26.2
1979-80	28	3.9	128	26.7

The under-utilisation of capacity had been ascribed to paucity of service demands either because some of the items became out-dated or were still under development by the R&D organisation and also delay in bulk production of a rocket in an ordnance factory caused by frequent changes in the design of the item (production was planned in July 1976 for 45,000 numbers per annum). Utilisation of the installed capacity for the production of the propellants and the ballistites was 3.85 per cent and 24.65 per cent on an average respectively up to 1979-80.

The OFB stated (October 1980) that capacity utilisation in the rocket propellant plant was expected to go up substantially not only for meeting the indigenous production of rocket and missiles, but also for replacement of the time-barred propellants and imported rockets and missiles.

Due to under-utilisation of the main plants, ancillary plants for production of process material and also the connected acid plants also remained under-utilised as indicated below :

Sl. No.	Nomenclature of plant	Installed capacity (per annum Tonnes)	Quantity produced in tonnes			
			1976-77	1977-78	1978-79	1979-80
1.	'P'	780	133	190	134	331
2.	'C'	1,083	77	108	89	71
3.	'R'	888	163	259	247	191
4.	Sulphuric acid/oleum	10,080	3,790	5,241	5,555	4,241
5.	Nitric acid	6,120	1,175	2,344	2,420	401

1.7 In order to utilise the spare capacity available in one of the two ancillary plants procured under the project for establishment of production capacity for rocket propellants and ballistites, Government accorded sanction in September 1977 for Rs. 4.23 lakhs for developing 4 varieties of industrial nitro cellulose for civil trade. All these had been developed, but bulk production thereof was yet to commence (October 1980) for lack of orders from trade.

1.8 Summing up.—The following main points emerge :

- none of the recommendations of the PAC (1972-73) have been adequately implemented;
- imports of explosive 'A', material 'X' and specified variety of explosive 'B' involved outgo of foreign exchange of Rs. 6.56 crores, Rs. 2.09 crores and Rs. 6.57 crores respectively;
- technology and equipment available in the factory became outmoded and investigations decided upon in 1972-73 in regard to production of material 'X' were yet (October 1980) to be completed;
- a loss of Rs. 28.60 lakhs occurred as a result of explosion of a plant;

- due to lack of service demands, the capacity newly created for production of rocket propellants and ballistites at a cost of Rs. 20 crores remained surplus to a considerable extent since inception (January 1977) and was proposed to be utilised for civil trade items.

[Paragraph 11 of the Report of the Comptroller and Auditor General of India for the year 1979-80, Union Government (Defence Services)].

1.9 A statement showing the installed capacity of the various process plants in an Ordnance Factory, and the percentage utilisation thereof during 1979-80, 1980-81 and 1981-82 (targets) and the future projection in respect of each plant, as furnished by the Department of Defence Production is reproduced as Appendix-I.

Explosive 'A'

1.10 The Audit Para points out that the annual installed capacity of the second hand plant for the manufacture of explosive 'A', which was originally fixed at 984 tonnes, was refixed at 804 tonnes subsequent to the guarantee run (1969-70) as agreed to by the supplier. The Committee desired to know the reasons why Government decided to go in for a second hand plant. The Secretary, Department of Defence Production stated in evidence :

"Basically, the particular item we are talking about is British technology, which was not available to anybody else at that time and even today it is my understanding that there are not many countries who have this technology available to them. Secondly, it is my understanding that tenders were invited and searches were made to see if there are alternative plants available. The British Government did not want to make any commitment to producing a new equipment from U.K. but this equipment has been used by them for four or five years. They reconditioned it wherever it was required and then it appeared to be a very cheap offer for giving this plant for 24 lakhs.

There was an alternative offer from West Germany for a totally new plant; but if you see technically the West German factory had no credentials or know-how to establish its facilities. Here, it is not merely a question of selling the equipment, but also to establish the process for the manufacture of the intermediate products. Therefore, it was the consideration way back in 1955-56 when this review was made. And I think it was a good beginning in that perspective."

1.11 On being pointed out that this particular plant was of 1937 vintage and that it was about twenty years old when it was purchased, the witness deposed :

"I am sorry I cannot categorically answer this, but can only say that the plant had been in use by the British Government for not more than five years when we bought it. I do not know whether it meant that the technology was of the '30s. But

we are certain that it was in use by the War Office only for about five years. Whether they bought it second-hand, we do not know. This plant is in full use now and will continue to be useful for a long time to come."

He added :

"I would like to submit that as far as I think the answers (to the PAC in 1971-72) generally covered this question, whether it was sensible, in retrospect, to have this plant. We paid about Rs. 20.4 lakhs for this plant. One of the three other plants did not work properly and the end product in this plant was obtained, cost effectively and the entire requirements were met by this plant till 1977-78 as intended originally. It was a profitable proposition. The provision is Rs. 25 lakhs for 6,083 tonnes. In terms of material costs we spent about Rs. 24 lakhs. We spent some money on building etc. But that is not a misadventure."

1.12 According to Audit Para, the actual annual production of the plant for manufacture of explosive 'A' continued to be far short of the installed capacity originally fixed at 984 tonnes, being 158 tonnes in 1974-75 and 594 tonnes in 1980-81. Asked about the reasons for this situation the Secretary, Department of Defence Production, explained :

"It is not merely a question of plant being antiquated, but availability of calcium carbide, location of the production unit, calcium carbide not being put to use as fertiliser in India while it is so used elsewhere. We imbibed certain features in the project which were not well thought of, but it is a small part of the total cost.

To come back to the question of capacity, 984 tons was the capacity given, I believe, at the time the plant was installed in the U.K. We have yet to re-determine whether that rated capacity has anything to do with the capacity when the plant was run-for guarantee tests. Some test was done for a period of seven days and with our eyes open we took the plant considering it had a capacity of 480 tons. 984 tons in my view is not relevant. After a period of time its residual life was 6 to 7 years when we took it."

The witness added :

"The record shows that the plant was procured by the British Government in 1937 and it had been put to use inter-mittently for a period of 5 to 6 years. They had, meanwhile, set up a bigger capacity plant. They were, therefore, willing to offer this plant to the Government of India at a concessional price, after conditioning or re-conditioning. So, possibly at that time, the estimated life was 15 years. It was actually purchased in 1937. In other words, it was not being used regularly except in the event of war."

1.13 Referring to the above statement of the witness, the Committee enquired whether it could be inferred that the life of the plant had come to an end when it was purchased. The witness stated :

"We can't believe it. As I said, technically it would have ended some years ago. But we still operate and maintain it so long as it is in working condition. I think, it will live for another two years. Meanwhile, some parts of this plant will be used for setting up a new unit. Even if this plant is inefficiently operated, we are hoping to maintain it economically. We are not writing it off now."

1.14 To a question from what point of time the residual life of the plant had been calculated, the witness replied :

"From the time of its installation, i.e. 1965. I am not using it as an argument, but I am just saying, we have used this plant for 15 years and during this time it has fully met the actual requirements in the country. Why should I have to bother that it was not producing 984 tons? It was only towards the end of 1978 when some additional requirement was there that some provision was made to import some quantity. I am quite happy that inspite of this afflux of time that has taken place, we could aim at attaining a standard capacity of 600 tons. It is a matter of coincidence that just yesterday we have got the users to agree to certain changes and rationalisation in specifications so that we could produce another 100 or 200 tons. This relates to the second part of the question, i.e. NCP capacity utilisation."

1.15 Asked whether it could be inferred that either the requirement was not there or it was being met through imports, the witness clarified :

"There were no imports till the end of 1978. The requirements till then were less than the capacity available. The average for the last 4 or 5 years has been 554 tons per year. Between 550 to 600 tons is the attainable capacity; this is by over stretching the plant. We are also investing on renewals and replacements. We think that this plant will run for a fairly long time."

The Committee enquired whether the basic purpose of setting up this factory about two decades ago for indigenisation and self-sufficiency in the field of defence materials i.e. explosives 'A', 'B' and 'C' had been achieved and whether these items were no longer being imported. The witness stated :

"To give you a total answer, to begin with, no, Sir. Broadly speaking, the purpose for which the factory was set up has been largely met in 1977-78. Secondly, some additional requirements did come up and the first import was made in December, 1978. On the negative side, there is one area where the equipment which we bought did not work very well for many reasons, and that was the DCD plant. The total cost of this was Rs. 11.5 lakhs. We had to shut down this plant a

couple of years ago and we are not using it at all. The general concept is that the raw material for manufacture of this chemical should be available at a very close place; it should be captive to the plant. Further, the scale of operation should be very high, otherwise it is not cost effective. The fact of the matter is that we do not have any calcium carbide production unit; we have to depend on indigenous sources; long lead and transport deteriorate the quality of the product. Because of these reasons, we thought that it was not worth while to run this plant. Import has been found to be cost effective and it was worked well and served the needs of the country."

1.16 The Committee desired to know the expenditure incurred on re-conditioning/part replacement of the plant. In a note, the Department of Defence Production, have stated :

"The second hand plant for manufacture of explosive A was re-conditioned by the supplier before its supply to the Ordnance Factory. The purchase cost of Rs. 23.73 lakhs included the cost of reconditioning which worked out to Rs. 11.42 lakhs. The cost of plant replacement purchased in U.K. was Rs. 10.20 lakhs (worked out at the then prevailing rate of exchange) and Rs. 3.8 lakhs purchased in India. Thus, it may be stated that the total cost of the plant, after re-conditioning completely was Rs. 38 lakhs (approx.). It may be added that a rebate of £ 1500 (Rs. 2.70 lakhs) was obtained from the supplier from the f.o.b. cost of Rs. 23.73 lakhs, due to a lower capacity demonstration of the plant."

1.17 The Committee wanted to know the frequency of breakdowns of the plant during each of the last three years and the expenditure incurred on its repairs. The Department of Defence Production have stated :

"The normal working of the plant is based on 22 days (24 hours per day base) in a month. The down-time actually occurred in the plant and the cost of repairs during the three years 1977-78 to 1979-80 is given below :

Year	Value of production of Explosive 'A'	%Downtime	Cost of repairs
77-78	Rs. 273.24 lakhs	22%	Rs. 3.20 lakhs
78-79	Rs. 236.43 lakhs	26%	Rs. 7.94 lakhs
79-80	Rs. 269.42 lakhs	23%	Rs. 6.62 lakhs

1.18 The Audit para points out that according to Ordnance Factory, about 20 to 25 per cent of the equipment has been replaced. Explaining details of renewal and replacement programme, the General Manager, Ordnance Factory, stated in evidence :

"After 1974-75 when we found that efficiency was dropping due to wear and tear of equipment we were trying to identify the bottleneck operations in the plant and those

bottleneck operations were being gradually widened by replacements which were due to be made in respect of the old plant. Another improvement which was done on the plant has also yielded better results than what we expected. I referred earlier to the installation of rotary vacuum filters. It has given slightly better results."

1.19 To a question whether improvements on modernisation were a normal process or these were necessitated by the exigencies of the situation, the witness deposed :

"It is to meet the increased requirements and obviously to maximise production. At one stage a mention has been made that only 480 tonnes could be made and with the replacements we were able to step up production to meet the pressing needs of the user factory."

1.20 In a written note, the Department of Defence Production have furnished the following details of cost of such replacements and the quantum of production now expected to be achieved :

"Ordnance Factory Board had referred to these percentages as approximate downtime percentages in various years. The replacements done from 1978 onwards amount to Rs. 25.03 lakhs. Additional replacements under consideration, for which expenditure in the coming 2 years is expected, would be about Rs. 8.00 lakhs. The above replacements are meant to ensure a sustained production of 550—600 tons of explosives per year.... The replacements are likely to be completed by 1983-84. After 1983-84, the replacements would depend upon the production of explosive 'A' in another sister factory coming up at Itarsi."

1.21 Asked what remedial measures were being taken to increase production in the factory to avoid imports which had been of the order of Rs. 6.56 crores upto 1980, as also to meet the future demand, the Department of Defence Production have replied :

"The imports of Explosive 'A' had to be resorted to meet the increasing requirements of Army for various kinds of ammunition, which could not be met by the production of Explosive 'A' at OF due to limited realisable capacity. The following statement will show that the total requirements of Explosive 'A' increased much beyond the capacity of the factory :

Year	Prod'n. at OF	Total requirement at a sister factory
1978-79	506 MT	660 MT
1979-80	515 MT	737 MT
1980-81	594 MT	1125 MT
1981-82	600 MT (expected upto 31-3-1982)	1375 MT (expected)

It may be pointed out that after the plant for Explosive 'A' went into regular production, the requirements were fully met till 1978 and hence no imports were resorted to till this period. Imports became necessary to meet the increasing requirements of Army, as stated above. Modifications and replacements of the value of Rs. 8 lakhs are under progress to ensure and sustain production of 550—600 tons of Explosive 'A' per annum. The modifications/replacements would be completed upto 1983-84 to achieve the above objective."

1.22 Clarifying the position further, the Secretary, Defence Production, stated in evidence :

"Our sustained production has been around 550 tonnes and odd. The actual total requirement of the using units has gone from 660 tonnes to 735 tonnes. This additional load has been catered for at another unit. Meanwhile, there will be marginal imports. But the later requirements will be met by the plant which is coming up at another place."

1.23 Asked what percentage of the defence requirements was being met from indigenous sources and how much was the import content, the Secretary, Defence Production stated :

"I would say, by and large we are self-sufficient. In most areas we are totally self-sufficient. But occasionally it does happen that sometimes when a new item is required, there would be some imports, but sooner or later we will set up our own production unit. Broadly I would say that we are self-sufficient so far as 90 per cent of our requirements are concerned."

(ii) *Process material 'X'*

1.24 For the manufacture of process material 'X' as against the capacity of 32.6 tonnes per month demonstrated by the foreign technicians by using indigenous material, the achievable capacity was indicated on the basis of experimental trials conducted in August-September 1975 as 9.74 tonnes per month (117 tonnes per annum) which would produce 160 tonnes of explosive 'A' per annum. The Committee desired to know why the achievable capacity was brought down to 9.74 tonnes per month as against 32.6 tonnes per month demonstrated by the foreign technician. The Department of Defence Production have, in a note, stated :

"The plant for process material 'X' was obtained as an integral part of the plant for Explosive 'A' and as such it was an old plant based on old technology. The supplier conducted various trials from 1965 to 1969 and after detailed investigations they could demonstrate a production capacity of 32.6 t.p.m. during a short run only using imported material 'Y' of quality much superior to the quality produced in the Factory Plant 'Y' from indigenous raw materials. Subsequent to the demonstration run, the availability of basic raw material for plant 'Y' became scarce from indigenous sources and supply was much lower than the requirement i.e. 600 ton per year

as against a requirement of 2000 ton/year. The raw material obtained indigenously was also poor. It further got deteriorated in transport and storage, resulting in poor yields of material 'Y', which is the process material for explosive 'A'. Even under the controlled conditions and strict supervision and round the clock maintenance in 8/75 and 9/75, the Factory could not achieve a capacity beyond 9.74 t/month in this old second hand plant, using outmoded and obsolete technology."

1.25 Asked why the total production of this material was only 86 tonnes during 4 years (1974-75 to 1977-78) and none in 1978-79 and 1979-80 resulting in imports of the value of Rs. 2.09 crores, the Ministry have stated :

"Against a requirement of 2000 tons of raw material per year, the Ordnance Factory could obtain 600 tons per annum due to scarcity of the material in the country. Moreover, the supplies of the raw material were erratic, necessitating storage for production purposes. The storage and transportation resulted in deterioration in quality, since the plant for material 'Y' could be run only after a minimum quantity of raw material could be accumulated/obtained for a production run. The cost of production of material 'X' from the old plant was found to be very high as compared to the imported cost of material 'X'. Further, assuming that we had obtained adequate quantities of raw material indigenously, the plant for material 'X' would have produced material 'X' only to the extent of 25% of the requirement for production of explosive 'A'. Taking into account the hopes given by FCI regarding supply of GN from their new plant and considering the uneconomic production of material 'X', it was decided to import Material 'X', which was an economically viable proposition."

1.26 The Committee desired to know the reason for the cost of production of process material 'X' in the factory being as high as Rs. 76,657 to Rs. 85,232 per ton as against the cost of imported material varying from Rs. 4,069 to Rs. 11,777 per ton. The Ministry have stated :

"The main reasons for the cost of production in the factory being for higher than the imported cost were :

- (i) high cost of input raw material @ Rs. 4600/- per ton compared to cost in Europe of Rs. 1100 to Rs. 1800 per ton.
- (ii) Deterioration in the quality of Calcium Carbide due to qualitative changes from the time to production of Calcium Carbide in the Carbide manufacturing factory to its utilisation at OF. Consequent on this, the material 'Y' produced at Bhandara contains only 18% to 20% nitrogen as against about 23.5% obtained abroad when Calcium Cynamide is produced in the same premises as Calcium Carbide.
- (iii) use of older technology of lower efficiency of conversion in OF second hand plant leading to high cost of production

of 'X' as against more modern and efficient technology adopted abroad.

- (iv) Scale factor : 'X' is produced abroad at a very high rate of production possibly a scale more than 15 to 20 times the capacities installed at the Factory."

1.27 The Public Accounts Committee (1972-73) had been informed that pending technical studies on the plant to achieve higher yield of material 'X' the plant would be run at a lower level consistent with the availability of basic raw material. The Committee have now been informed that trials carried out on the advice of the National Chemical Laboratory, Pune had not been found encouraging possibly due to very limited trials. Asked why even after so many years, it had not been possible to devise ways and means to improve the efficiency of the plant with a view to achieving higher yield of material 'X', the Department of Defence Production have stated :

"For improving the yields, the factory had under-taken three distinct runs during 12/74 to 9/75 under controlled conditions which did not reveal any improvement. In April, 1964, National Chemical Laboratory, Pune was approached to develop on the pilot plant a process technology for more efficient production of Material 'X' from Material 'Y' by using Carbonation injection process. NCL gave a report in August, 76 based on which plant scale trials were conducted at the Factory in the presence of representatives of Engineers India Ltd. The trials at the Factory did not reproduce the performance of the pilot plant process at NCL. It was advised by NCL that unless major modifications/replacements were carried out in the plant, full benefit of their process could not be achieved. Delay in undertaking plant scale trials was due to Fertiliser Corporation of India failing to supply Gunadine Nitrate in adequate quantity. Explosive A is made from Gunadine Nitrate which is made from material X. M/s. Engineers India Ltd. were consulted by the Factory to indicate the likely investment involved and the estimated cost of production after modification using Carbonation process suggested by NCL. The assessment made both by the Factory and the Engineers India Ltd. were consulted by the Factory to indicate Rs. 1.70 crores was required for doing major modifications/replacements and the estimated cost of production would be Rs. 47,000/- per tonne of Material X as against Rs. 11,777 per tonne of imported material X in 1979-80. Further, it was assessed that adoption of improved carbonation process technology at a cost of Rs. 1.70 Cr. though expected to improve conversion efficiency would not result in increased production of Material 'X' due to increased time-cycle.

It was thus not found cost effective, both from the additional investment point of view and the higher cost of production, to carry out modification of the plant."

1.28 The Ordnance Factory has stated that the trial using the Carbonation process having failed there was no scope of manufacturing material 'X' economically. The Committee enquired why these difficulties could not be visualised earlier and what was now proposed to be done in this regard. In a note, the Ministry of Defence have stated :

"The trials using carbonation process were not successful and NCL had opined that modification/replacements to the equipment would be required if benefits of NCL carbonation technology in the existing plant were to be derived.

Studies by EIL indicated that modification/replacements to adopt the NCL technology in our existing plant would require a heavy investment and even if we succeeded in deriving the full benefit of NCL technology after investing the heavy amount the cost of production of 'X' would be around Rs. 47,000 per tonne as against that of imported cost of Rs. 11,777/- tonne.

In view of the above and since the requirement of 'X' in the Country is much more than what is required at OF, efforts have been made to interest Public and Private Sector to put up higher capacity plants for 'X' using modern technology available.

Plant for material 'X' was procured as an integral part of the plant for manufacture of explosive 'A' and it was expected to produce matching quantity of 'X' at economic cost for production of 'A'. Subsequently it was observed that this plant could not produce material 'X' economically at the required level of production due to various reasons listed above."

1.29 The Committee desired to know the latest position in regard to production and supply of the intermediate product for explosive 'A' from Public Sector undertaking. The Department of Defence Production have stated :

"No Public Sector Undertaking so far has come forward for out-turn manufacture of intermediate product for explosive 'A' and hence the factory depends mainly on imported material 'X'. Two private parties have now offered to make the product subject to condition that either calcium cyanamide plant is sold to them or leased out."

1.30 Asked whether any offer was there from some other parties, the Secretary Defence Production stated in evidence :

"There are offers under consideration. In fact, there are some people interested to consider the desirability of setting up a composite plant which is beyond our means. We do not want to go into it if we can avoid it. There are some parties who are interested in buying it and then setting up a capacity not far away from where we are. This project is being worked out. The details have not yet been established. This has an application on the civil trade also in industries like plastics, pharmaceuticals etc. The requirements are so dispersed. The

hopeful sign here is that certain plastic application of a particular item is picking up. Some people are now getting interested in this. The point that I would like to mention again is that the cost will still be three or four times the imported cost. It is a question of scale of manufacture. If it is used in fertiliser application, you can imagine the scale of manufacture. Even between countries and countries, the price varies."

1.31 Asked how it would be economical for the private firms to run the plant the witness replied :

"Either we get it or the private sector does it, the cost will be prohibitive. We have a plant which we are not using. We find it uneconomical to use it; we find it uneconomical to invest further. Even then, the cost will be very much high. It is also the quality of calcium carbide plus the cost of manufacture and the scale of manufacture. We have to take into account these factors. But the information is not available to us. It is available to private parties who cater to the needs of the civil market. It may be economical to the private parties to meet their requirements incidentally because they give them this plant on lease. We would like to make certain valuation. The present indications are that prices are not going to be reasonable. Private party is not going to give propaganda to this economic study. But it is expecting, as I mentioned, that the pharmaceuticals and particularly the plastic trade is, according to their estimates of marketing, likely to pickup. It is a product which has made a dent into the country possibly because of cheap imports. If the scale of manufacture is increased, then a private party may be able to make the stuff. To repeat again, the cost will be still 4 times of the imported price and that is the reason for our agitation at the moment. The matter is being studied and examined whether we should go into a venture of this kind."

He added :

"They have not made any commitments. But they are looking into the possibilities. They might decide to the effect that they are not interested. But dialogue is going on from about 12 months. Neither side has taken any definite view."

(III) *Process Material 'Y'*

1.32 Referring to the comments of Audit that production of process material 'Y' in the imported plant had shown a sharp decline from 561 tonnes in 1974-75 to 43 tonnes in 1978-79 and 66 tonnes in 1979-80 as against the assessed capacity of 3780 tonnes per annum, due to limited availability of basic raw material viz. calcium carbide, the Committee enquired what steps had been taken to get over this difficulty. In reply, the Department of Defence Production have stated :

"(i) Process material 'Y' is the starting material for manufacture of process material 'X'. It has already been explained that on account of the abnormally high cost of production of material 'X' from 'Y' in the second hand outdated imported plant, the

plant was not being operated. Further, the Factory could get supplies of only 600 tonnes a year of calcium carbide as against a requirement of 2000 tonnes a year.

- (ii) Due to limited availability of calcium carbide coupled with the high cost of production of 'X' from 'Y' the production of 'Y' declined in 1978-79 and 1979-80.
- (iii) Though the basic raw material (Calcium Carbide) is now available indigenously it is not proposed to procure the same, as the production of 'X' out of 'Y' is quite uneconomical in the plant for 'X' of out-moded technology."

1.33 Asked to what extent the shortfall in production of material 'Y' had affected the production of Explosive 'A', the Department of Defence Production have replied :

"The shortfall in production of process material 'Y' has not affected production of explosive 'A' as the same was being manufactured utilising imported 'X' which was much cheaper."

1.34 The Committee wanted to know whether there were any policy prohibition in importing these products. The Secretary, Defence Production stated in evidence :

"No Sir. At that time, there were very few producers. Today, there are many countries which are producing it. It is freely available Nevertheless, in the ultimate eventuality, if we can indigenise it by paying a higher price which is three or four times the world price today, that can work. Those efforts are being made."

1.35 The Department of Defence Production had earlier stated that as material 'Y' was produced only to meet civil trade requirements, procurement of basic raw material to produce it was met. The Committee enquired why higher capacity was created if the plant was required to be utilised for a very limited purpose. In a note; the Ministry have stated :

"Initially the capacity was created to meet the estimated requirements of 'Y' for production of 'X' on the integrated plant procured for manufacture of explosive 'A' and not for supply to civil sector. Since manufacture of material 'X' from indigenous calcium carbide was uneconomic and there was a demand for civil sector for material 'Y' the plant 'Y' is being run from time to time to meet the trade demands. Hence the high capacity created is linked with production of finished explosive 'A' and not with any civil trade demands. The plant 'Y' is run to meet civil trade requirements of material 'Y', which are being met in full.

The plant for 'Y' is being operated to a small extent of 200 tonne per year to meet the civil trade requirements. The plant is not being operated for production of 'Y' specifically for manufacture of 'X' for the reasons already mentioned above. The procurement of basic raw material, Calcium Carbide is therefore limited to the above civil trade requirements of 'Y'."

1.36 The basic raw material i.e. Calcium Carbide which is obtained from Kerala and Tamil Nadu gets deteriorated during transportation to the Ordnance Factory. Asked whether efforts were ever made to set up ancillary units around the factory to see that process material 'Y' viz. Calcium Cyanamide was made available there itself, the Secretary, Defence Production stated :

"Firstly, the degradation of this material takes place because of the moisture. It also gets deteriorated because of long transportation.

About the second part of your question, we don't think that it was necessary to set up a plant, because even if we ultimately manufacture it in the country, the cost will be still prohibitive as compared to the price at which it is available from outside."

The General Manager, Ordnance Factory, clarified :

"At the time we conceived the factory, we did try to persuade the then existing manufacturers to set up the calcium cyanamide plant at their Carbide Works. Since the Defence requirements tend to fluctuate very much, no manufacturer came forward to set up a plant of this small capacity. Therefore, we had no option but to set up a Calcium Cyanamide plant as our captive unit."

He further stated :

"In 1958-59, when we went in for the Project and the Committee which went into the capacity of the production units of the factory, at the outset said it will be better if we become self-reliant for this complex as a whole. But now, Sir, we have four or five parties abroad manufacturing DCD chemical on a bulk scale."

Explosive 'B'

1.37 The Audit para points out that against the annual installed capacity of 810 tonnes in terms of a single variety of propellant, the realisable capacity computed for a product mix of 4 different types of propellants for which the plant was designed was assessed as 720 tonnes only including 60 tonnes ear-marked for Research and Development (R&D) establishment. In this connection the Committee referred to paragraph 2.63 of their 92nd Report (5th Lok Sabha—1972-73) wherein it has been mentioned that the above capacity could be fully utilised provided the factory could produce a different variety of explosive 'B' which require a small addition of another explosive to be produced in another plant planned to be set up as an integral part of the rocket and propellant project for manufacture of a highly sensitive substance. Even though this plant was commissioned in January 1975, production of the specified variety of explosive 'B' for the development of which Rs. 4.13 lakhs had already been spent upto 1979-80, could not be established using the technology and equipment available in the factory.

Clarifying the position in this regard, the Secretary, Defence Production stated in evidence :

"This is only partly valid. That is another way of looking at it. We have been unduly guilty of explaining this at this stage. The total requirement of NC powder even at our other factory has been something like 1700 tonnes since 1975-76 upto now. O.F. was not set up for this. This is called 7.762 which is an entirely different technology and was a gift from a foreign country. The outer casing is the same. The ammunition filling and contents specification are materially different. The O.F. unit has been producing and trying to give the highest crust of what they make as an additional production to another factory and they have fed them with something like 522 tonnes of this variant so far. As against that, the import has been 1349 tonnes. That is 1400 tonnes and 522 tonnes from O.F. from our normal production. Meanwhile we have been trying in consultation with the Research & Development people to review the two specifications and by sheer coincidence they have agreed that O.F. specifications will be accepted in the other factory also and we hope to be able to step up production by another couple of 100 tonnes. Ultimately this requirement is catered for. But with the rationalisation of specifications we will be able to meet another 200 to 300 tonnes but this will take another year or two."

1.38 The Committee enquired since how long the specified variety of explosive 'B' for 7.62 ammunition had been under development. The Department of Defence Production have stated :

"The plant at O.F. was not designed to produce the specified type of explosive 'B' and hence development trials were undertaken for its manufacture from 1971-72. In all 46 trials for establishment of production of Explosive 'B' for another factory have been conducted, with and without Nitroglycerine with the help of advice from plant supplier. It was not, however, possible to establish the specified variety on a sustained basis although off and on some batches passed specification. Even though at O.F. the production of Explosive 'B' could not be established on a sustained basis, 522 tonnes of the explosive which met specifications were supplied saving foreign exchange to the tune of approx. Rs. 2.05 crores."

1.39 Asked by what time production of explosive 'B' was expected to be established in the Ordnance Factory, the Ministry of Defence have stated :

"A review of different specifications for weapon has been recently undertaken by the AHSP in consultation with the users and producers and as a result of the rationalisation now accepted, it is expected that substantial quantity of OF's production of explosive 'B' can be directed to the user factory."

1.40 To another question whether assistance from foreign experts had been sought/availed of, the Ministry have replied that development trials were undertaken with the help and advice from foreign plant suppliers.

1.41 The Committee referred to an earlier note of the Department of Defence Production, wherein it had been stated that the upto date expenditure incurred on the establishment of production of specified variety of explosive 'B' was approximately Rs. 3.5 lakhs. However, the Audit Para points out that even though this plant was commissioned in the factory in Jan. '75 production of the specified variety of explosive 'B' for the development of which Rs. 4.13 lakhs had already been spent upto 1979-80 could not be established. Asked to reconcile these two figures of expenditure and also to indicate the total expenditure incurred so far, the Ministry of Defence have replied :

"Commissioning of the plant in January, 1975 referred to Nitroglycerine plant which was installed as an integral part of the Rocket and Ballistite project essential to cater to the needs of manufacture of Rockets and Ballistite propellants and was not mainly intended for manufacture of the specified variety of explosive 'B'. However with Nitroglycerine being available at O.F. from January 1975 development trials for manufacture of specified variety of explosive 'B' were pursued. Despite repeated trials and consultations and advice from M/s. _____ the plant supplier (for producing NG Powders), Production of the new variety could not be established in this plant which was not designed for production of this variety of explosive 'B'. Hence even though Nitroglycerine was available as spill off of the R&B project we could not establish the production of this new variety using the technology and equipment available at this factory. .

The figures of Rs. 3.5 lakhs indicated by the factory and the figure of Rs. 4.13 lakhs indicated by audit appear to be based on earlier provisional figures; whereas a figure of Rs. 4.37 lakhs has now been given by LAO as representing the expenditure so far incurred."

1.42 Asked whether the indent of May 1980 for import of 292 tonnes of this explosive had since materialised, the Department of Defence Production have stated that a contract has been concluded by DGSW London for supply of the above quantity on 13th April, 1981 at the rate of 50 M.T. per month from July, 1981. Supplies are yet to materialise.

Process Material 'H'

1.43 The Audit Para states that the shortfall in production of process material 'H' was due to restricted production to keep pace with the requirement of explosive and also due to the fact that the demand for the item from the civil trade was low. Asked on what basis the requirements were anticipated at the time of setting up of capacity for production of the material, the Ministry of Defence have stated :

"Since process material 'H' is the input for the plant for explosive 'C' the capacity for process material 'H' has fixed to match the production capacity of the plant for Explosive 'C'. The capacity for plant for Explosive 'C' itself was fixed based on peace time and wartime requirement as also the closest standard capacity plant, safety in operation abroad. Number of items of the

finished stores requiring explosive 'C' as assessed in 1957-58 prior to sanctioning the factory at Bhandara were 21. Out of these only 7 Nos. of items are today current with the Services.

Since the actual requirement from Services for the finished stores requiring Explosive 'C' was lower than the installed capacity, the plant for Explosive 'C' remained underutilised to varying degrees. Consequently, the requirement of process material 'H' was also correspondingly lower.

From 1974-75 onwards the factory has met fully the requirements of end products. It must be mentioned that Ordnance Factory is one of the 8 producers in the world which possess the production capability for explosive 'C' which is far superior in performance as high explosive when compared to TNT and hence this should be considered as a national asset for Defence preparedness.

There are indications from the Armed Forces for a new low temperature plastic demolition explosive. This facility when set up will require explosive 'C' and therefore process material 'H' to the extent of about 20% of the installed capacity. The Defence R&D is also designing a new series of propellant which would call for substantial quantities of Explosives 'C' and therefore process material 'H'."

1.44 In reply to a question how the cost of production of this process material in the Ordnance Factory compared with the cost in the private sector, the Department of Defence Production have stated :

"Our current selling prices and those of other producers are indicated below :

Our current selling price per tonne from 1-5-81 and valid upto 31-3-82	The current selling rates per tonne as indicated to us by other producers
Rs. 16,500	1. M/sRs. 19,000
	2. M/sRs. 20,000
	3. M/sRs. 17,000

It will be seen from above that the current selling price of the Factory are quite favourable and sale of substantial quantity to civil trade is expected."

Acid Plants

1.45 The Committee enquired why utilisation of the acid plants was only 14.6 to 59.9 per cent of the capacities as pointed out in the Audit Para and what steps were being taken to optimise their utilisation. In reply the Department of Defence Production have stated :

"The main reasons for low utilisation of Acid Plants capacities are :—

Percentage utilisation of 14.6% refers to Sulphuric Acid concentration in 1974-75, while 59% refers to Strong Nitric Acid

plant in 1978-79. In 1979-80 the utilisation has been ranging from 30 to 57%. Acid plants are ancillary to main explosive plants producing the required process materials. The under utilisation of acid plants is a sequel to the under utilisation of main plants. Manufacture of process materials have necessarily to keep pace with the requirement for the finished explosives whose quantum of production is governed by demands from Service for the finished ammunition stores. Hence manufacture of process materials could not be undertaken to the extent of capacity. Production in acid plants was matching the requirements for manufacture of finished explosives apart from meeting the requirements of sister factories and civil trade.

The following steps have been adopted for increase utilisation to the extent possible :

- (a) Supply to sister factories and trade.
- (b) Diversification for commercial explosive plant which would now utilise capacity of Nitric Acid and Sulphuric Acid to the extent of 1295 tonnes and 1340 tonnes respectively."

R and B Plants

1.46 The Audit Para points out that the plants erected/commissioned, under the project for the creation of additional capacity for production of 1,200 tonnes per annum of rocket propellants and ballistites sanctioned in May 1969 and required to be completed within 4 to 5 years from the time of sanction, were taken over by the factory between January 1975 and December 1976 against the target date of May 1974. The delay in taking over all the plants had been attributed to delay in completing the guarantee run for one plant. The Committee enquired whether the reasons for delay in erection of the plants had been examined. The Ministry of Defence have stated :

"Delay was not due to lack of planning. The plants were ready for production in September 1974 though formal taking over was on 18.3.76. The delay of about 5 months occurred in commissioning of the main and product plants. Taking over had to be done not only after guarantee run but after the versatility run to ascertain the range of product which the plant could yield. Hence the delay. Delay was also due to delay in clearance of products produced during guarantee run at proof by the inspectors."

The capacity utilisation in respect of rocket propellants, according to Audit Para, has ranged between 2.5 to 4.1% of the installed capacity of 720 tonnes while in the case of ballistites it has ranged between 9.2 to 38.5% against the installed capacity of 480 tonnes during the period 1976-77 to 1979-80. The underutilisation has been ascribed to paucity of demand which itself is stated to be partly due to some of the items having become outdated. The Committee wanted to know why the question of updating technology was not fully considered before setting up these plants. The Secretary, Defence Production explained in evidence :

1.47 "This plant was set up for three specific uses of which two disappeared soon after the plant was set up. In addition to the two main users of this plant, we have gone into the manufacture of commercial explosive for Coal India which has made an investment of Rs. 6.7 crores in a captive plant. We have been feeding that plant and this has led to a tremendous utilisation of that plant."

1.48 In a note furnished in March 1982, the Department of Defence Production have further stated:

"Production has to be regulated conforming to production programme for rocket propellants and ballistites, which in turn is governed by user demands. At the time of sanction of project, 28 items of ammunition/rockets were indicated as being likely requirements, but actual orders from users cover only a few items. In fact 2 items of Rockets which have been since with drawn, account for a capacity of 624 tonnes per year of the installed capacity of Rocket Propellant. Similarly one item of end store requiring Ballistites since with drawn account for an annual capacity of 276 tonnes out of 480 tonnes capacity installed. Rest of the items have either become obsolescent or are still under development with Defence R&D. After the plant went into production, full requirements of rocket propellants and Ballistites have been met.

The obsolescence referred to pertained to ammunition/rocket items in use and not to technology of manufacture in the plant installed at OF. In fact the plant installed at the Factory is modern employing latest technology capable of versatile production for supplying solid extruded propellant for different types of rockets and missiles."

1.49 Explaining the steps taken in the matter the Ministry have stated:

"Development of manufacture of various items of rocket propellant in the plant for Defence R&D had been undertaken out of which rocket propellants for two items have become regular items of production. It is also expected to manufacture rocket propellant for 2 more rockets. Further, as and when new items of Rocket propellants are developed by R&D, bulk production could be taken up as the plant installed is versatile.

Regarding ballistite plant it may be stated that the entire requirement of user factories is being met in full. It has also been decided to produce propellant for anti-tank ammunition the production of which has been established on the ballistite plant at OF. These measures would improve capacity utilisation of R&B plants."

1.50 A number of rockets, missiles and propellants are stated to be under development. The Committee desired to know for how long these had been under development and what was the time frame envisaged for

their bulk production. The Department of Defence Production have stated :

“OF is developing only the propellant required for various rockets and missiles”.

The present position of items under development in Rocket Plant is furnished in Annexure II (not enclosed). Out of the items developed, Rocket Propellant for two items have been productionised already. With increasing requirement of missiles in future the Rocket Propellant would be progressively utilised more and more. The prospects of items under development becoming regular production items appear to be as under:

Ph. I (8 Items)	Expected load	250 tonnes	per year	Time Frame
				2 years
Ph. II (10 Items)	„	150 tonnes	„	3 to 4 years
Ph. III (4 Items)		Not known	beyond	4 years”

1.51 Asked whether any assessment had been made of the requirements of the civil users and if so, the extent to which the available production capacity could be utilised, the Ministry have replied:

“No use in Civil Sector is expected for rocket propellants and ballistites. Process materials such as Nitroglycerin, Nitrocellulose and Nitric and Sulphuric Acids, are manufactured in the ancillary process plants of the main plants for manufacture of finished items of explosives/propellants. We have surplus arisings of process materials such as Acids. Those are being marketed to civil trade to the extent of the demand from civil users.

A major diversification for production of commercial explosives for Coal India has already been applied. The products of commercial explosives plant would need substantial quantities of Nitroglycerine, Nitrocellulose and Acids with this diversification the utilisation of ancillary plants is expected to go up as follows :

	81/82	Future
Sulphuric Acid	52.6%	64.5%
Nitric Acid	61%	73%

1.52 The Audit Para points out that out of 6 items of rocket propellants orders for the development of which were placed, 2 items were established in 1975-76 and one item was developed in 1976-77. Explaining the position with regard to development of the remaining items, the Department of Defence Production stated that all other items have been developed and established except only one item.....which was still under testing by Naval Inspectorate.

1.53 Asked about the present position with regard to the bulk production of four varieties of industrial Nitrocellulose for which spare capacity was available in one of the two ancillary plants and the response of Civil indentors, the Ministry have replied :

"Bulk production has not been undertaken so far. A large number of Civil indentors were approached indicating the availability of material but only four firms called for samples which have been sent to them. No firm orders, however, have been placed by any Civil Indentor so far and hence bulk production is yet to commence."

"Further market survey reveals that Butanol wet industrial Nitrocellulose is required by many firms where as we have facility for making only water wet or Ethanol Wet Industrial N.C. Proposals are being considered for setting up facility for Butanol wetting of Industrial N.C. so as to utilise the surplus capacity available."

1.54 One out of 2 units of ancillary plant procured for producing the highly sensitive substance under the project is stated to have exploded in May 1975 during commissioning trial and the whole plant and building including certain material (costing Rs. 28.60 lakhs) were destroyed. In this connection, the Department of Defence production have stated that accident was investigated by plant designer who concluded that it happened as a cumulative effect of 5 or 6 technical reasons for which no particular person or party could be held responsible. Hence no further investigations were made.

1.55 Recommendations made by the Board of Enquiry are reproduced below:

"It has been clearly demonstrated that the accident has no relation whatsoever with the mechanical features or with the safety system of the Plant; therefore no essential modifications in the design or the construction of a new plant or of the A-1 Plant are considered desirable. However, the extreme climatic conditions of the site call for the following additional safety measures:—

- (1) The spent acid should not be stored for longer than one week.
- (2) Its temperature in the storage and overhead tanks should not go beyond 30 C. Temperature monitoring with alarm should be installed.
- (3) Water dilution of the spent acid should be carried out only during the cold months, when the temperature of the acid during storage could go lower than 20 C.
- (4) Spent acid analysis before and after dilution should be carried out daily.
- (5) In case of an unusual occurrence, responsible person should be present in the nitration house.
- (6) After an idle period of longer than two weeks in winter or one week in summer, fresh spent acid should be prepared for the starting up of the Plant, if the HNO₂ contents are higher than 0.3%

- (7) The use of closed circuit TV and air conditioning of the nitration room are considered desirable but optional.
- (8) The use of a probe indicating the No. 2 contents in the air above the acid separator is recommended. This system is still in the development stage."

1.56 The General Manager, Ordnance Factory, stated in the evidence :

"The basic factors were unstable spent acid; wrong position of internal instrument controls during the commissioning period; the period for which the spent acid was held in circulation, the spent acid used for starting the plant every morning and the extent of dilution of spent acid that was being permitted."

He further stated :

"This explosive is one of the most sensitive ones. Explosions on such plants have taken place in several countries. It is also used for dynamite. There have been instances of explosions all over the world, and we have been lucky so far."

1.57 The Chairman, Ordnance Factory Board further deposed that the plant at that time was being operated by the supplier's man himself.

1.58 Asked whether responsibility had been fixed for the loss of Rs. 28.60 lakhs on this account, the Ministry replied in the negative and stated that Rs. 26.33 lakhs have since been made good due to insurance coverage.

1.59 Explaining the measures taken for the safety of the plant in future, the Department of Defence Production, in a note, have stated :

"The firm had after investigation suggested six modifications in the operating conditions which are vital for the safety of the plant. All these six recommendations have been implemented and are being ensured currently.

The firm had also suggested use of closed circuit TV and air-conditioning of the Nitration room. While the closed circuit TV has been brought in, the air conditioning which was termed as optional by the supplier has not been done since it would have the undesirable effect of separation Nitroglycerine leading to accidents.

They have also suggested the possibility of having a special probe for watching nitrogen oxide content in the Acid separator. However, this system, according to them, is still under development stage with them."

1.60 The audit para refers to the continued under-utilisation of the production capacity in various plants of an Ordnance Factory, which manufactures certain types of explosives for the army. The Public Accounts Committee (1972-73) in their 92nd Report on the subject had recommended that efforts should be made to bring down the cost of production of process material 'X' required for the manufacture of explosive 'A'; there should be no delay in establishing the required variety of explosive 'B' for a particular ammunition

after 1974 and that the process material plant for explosive 'C' should be fully utilised. The Committee regret to note from a review in Audit in February 1980 of the performance of the factory that none of the recommendations of the Committee have been adequately implemented. The Committee have been informed that although it has not been possible for various reasons to optimise the production on lines recommended by the Public Accounts Committee, the requirements of explosives had been fully met till 1977-78 when there was a sudden spurt in the demand and imports had to be resorted to.

1.61 The Committee find that the actual production of the plant for production of explosive 'A' during the period 1974-75 to 1980-81 has fluctuated between 158 to 600 tonnes as against the established capacity of 660 tonnes per year. The production is, however, stated to have gone up since 1978-79 and the average during the four years ending 1981-82 was of the order of about 554 tonnes.

1.62 The Committee were informed that the Plant which was of 1937 vintage had been in use in the supplier country (U.K.) for 5 to 6 years and that its residual life was 6 to 7 years when it was installed in 1965. During the years 1977-78, 1978-79 and 1979-80, the cost of repairs amounted to Rs. 17.76 lakhs and the down-time was as high as 22%, 26% and 23% in the respective years. Additional replacements under consideration would involve an expenditure of Rs. 8 lakhs during the next two years and ensure a sustained production of 550-600 tonnes of explosives per year. The Committee consider that the economics of working of the plant which has now outlived its useful life, should be carefully examined in the context of the decision to set up a new plant at another place before incurring any further expenditure on its re-conditioning.

1.63 The Committee find that since there was no captive plant for production of calcium carbide which was the basic raw material for manufacture of explosive 'A', the same had to be obtained from as far as Kerala and Tamilnadu. Apart from the cost of transportation being high, the chemical composition deteriorated fast due to ingress of moisture during transit and during storage with the result that the finished material was of poor quality. The Committee consider it very unfortunate that such a situation has been allowed to linger on over the years without any thought having been given to get over the problem. The Committee are greatly concerned that the factory has been producing sub-standard explosives for the army. The situation needs to be remedied without delay. The Committee would like to be apprised of the steps proposed to be taken in the matter.

1.64 The Committee find that against the total requirements of 3897 MT of Explosive 'A' during the four years 1978-79 to 1981-82, the production in the Ordnance Factory, during this period was only 2215 MT leaving a gap of 1682 MT (about 43%) which was met through imports (cost Rs. 6.56 crores till 1980). The Committee trust that with the coming up of a modern plant at another place based on latest technology, the increasing requirements of the Army as well as of civil users such as Coal India Ltd., will be fully met.

1.65 For the manufacture of process material 'X', as against the capacity of 32.6 tonnes per month demonstrated by the foreign technicians by using imported material, the achievable capacity indicated on the basis of experimental trials conducted in August-September 1975 was 9.74 tonnes per month (117 tonnes per annum) sufficient to produce 160 tonnes of explosive 'A' per

annum. The Committee, however, find that the total production of this process material during 4 years (1974-75 to 1977-78) was only 86 tonnes and none in 1978-79 and 1979-80 resulting in imports of the value of Rs. 2.09 crores. The very restricted production in earlier years and subsequent stoppage is attributed to scarcity of basic raw material for process material 'Y' from indigenous sources, the supply being 600 tonnes as against a requirement of 2000 tonnes per year. The Committee find that the cost of production in the factory was as high as Rs. 76,657 to Rs. 85,232 per tonne as against the cost of imported material varying from Rs. 4,069 to Rs. 11,777 per tonne. Fresh efforts towards improving the yield by carrying out modification of the plant have not met with success. Adoption of imported carbonation process technology suggested by National Chemical Laboratory Pune, at an estimated cost of Rs. 1.70 crores though expected to improve conversion efficiency would also not result in increased production of material 'X' due to increased time cycle. Moreover, the cost of production of the end product would be around Rs. 47,000 as against Rs. 11,777 per tonne of the imported variety. The trials using the carbonation process having failed, there is now no scope of manufacturing material 'X' economically thus rendering the investment on this plant infructuous.

1.66 The Committee understand that some private parties have offered to make the product subject to the condition that the plant is sold to them or leased out. The Committee would like to be apprised of the outcome of these efforts.

1.67 Production of process material 'Y' which is the starting material for manufacture of process material 'X' declined sharply from 561 tonnes in 1974-75 to 43 tonnes in 1978-79 and 66 tonnes in 1979-80 as against the assessed capacity of 3780 tonnes per annum, the principal reasons being limited availability of basic raw material and abnormally high cost of production of process material 'X' from 'Y'. Although the basic raw material is now available indigenously, it is not proposed to procure the same as the production of process material 'X' from 'Y' is quite uneconomical. The plant is being operated to a small extent of 200 tonnes per year to meet the non-defence requirements. As such limited production is bound to be very uneconomical and the factory itself has no use for this plant, the Committee consider that the same should be disposed of or leased out to some public or private undertaking which can utilise it better.

1.68 The production of explosive 'B' is equally unsatisfactory. As against the installed capacity of 810 tonnes, the production was only 400 tonnes in 1978-79 and 335 tonnes in 1979-80. Since the plant for production of this explosive had not been working to the rated capacity, it was proposed to produce a different variety of explosive which was still under development. The Committee find that despite the fact that development trials for the manufacture of the specified variety of the explosive 'B' have been going on since 1971-72, it has not been possible to establish production thereof on a sustained basis. The expenditure of Rs. 4.37 lakhs so far incurred on the development effort has thus yielded no results. The Committee have been given to understand that as a result of a review of different specifications for the weapon undertaken recently by the AHSP in consultation with the users and producers, it has been possible to make them agree to certain changes and rationalisation in specifications.

1.69 In their 92nd Report (Fifth Lok Sabha) the Committee had drawn attention as early as in 1972-73 to the need for establishing the production of the required variety of explosive 'B' so as to ensure better utilisation of the available capacity. The Committee consider it unfortunate that no progress could be made in this regard even over a period of 10 years. The Committee expect that with the rationalisation now agreed upon by the users, all efforts would be made to utilise the available capacity to the optimum level.

1.70 The Committee find that the production of process material 'H' which is the input for the plant for explosive 'C' fluctuated between 192 tonnes to 352 tonnes during 1974-75 to 1979-80 as against the realisable capacity of 1,284 tonnes. The shortfall is attributed to restricted production to keep pace with the requirement of explosive 'C' and also due to the fact that the demand for the item from the civil trade was low. The Committee have been informed that the number of items of the finished stores requiring explosive 'C' has come down from 21 in 1957-58 to only 7 at present. However, the Ordnance factory is stated to be one of the eight producers in the world possessing the production capability for explosive 'C' which is far superior in performance as high explosive when compared to TNT and hence it is a national asset for defence preparedness. The Committee find that the Armed Forces have indicated demand for a new low temperature plastic explosive. This facility when set up will require explosive 'C'. The R&D is designing a new series of propellant which when developed and introduced would also call for substantial quantities of explosive 'C' and hence process material 'H'. The Committee expect that efforts in this direction will be pursued with vigour. They would like to be informed of the progress made and the results achieved.

1.71 The Committee find from the statement given in Appendix I that the utilisation of sulphuric acid plant was as low as 42% and 47% of the capacity during the years 1979-80 and 1980-81 while that of nitric acid plant was 7% and 52% in the respective years. This is stated to be a sequel to the under-utilisation of the main plants. Steps have been taken for increased utilisation by supplying to sister factories and trade and diversification of commercial explosive plant which would utilise the capacity of nitric acid and sulphuric acid plants to the extent of 1295 tonnes and 1340 tonnes *vis-a-vis* the installed capacity of the order of 6,120 tonnes and 10,080 tonnes respectively. The Committee desire that concerted efforts should be made to tap the market in the civil sector so that the capacity utilisation of these plants can be stepped up.

1.72 The Committee understand that a project for creation of additional capacity for production of 1200 tonnes per annum of rocket propellants and ballistites was sanctioned in May 1969 at an estimated cost of Rs. 17.14 crores. There was considerable delay in the erection/commissioning of plants, the same having been taken over by the factory between January 1975 and December 1976 against the target date of May 1974 due to delay in completing the guarantee/versatility run of one plant. The estimated cost of the project had in the meantime (April 1972) increased to Rs. 20.034 crores.

1.73 Apart from the delay, the performance of the plants has been much below the stipulated level. Out of the installed capacity of 720 tonnes for the propellants and 480 tonnes of ballistites, the actual quantities manufactured during the four years from 1976-77 to 1979-80, have ranged between 18 and 30 tonnes for the first item and 44 and 185 tonnes for the second one. The capacity utilisation has thus been as low as 2.5 to 4.1% and 9.2 to 38.5% respectively.

1.74 The Committee are surprised to note that as against 28 items of ammunition/rockets indicated as the likely requirements, actual orders cover only a few items. In fact, two items of rockets which have since been withdrawn, account for a capacity of 624 tonnes against the total installed capacity of 720 tonnes while another item of end store requiring ballistites since withdrawn accounts for an annual capacity of 276 tonnes out of a total of 480 tonnes of ballistite capacity. Rest of the items are stated to have become either obsolescent or are still under development with Defence R&D. The Ministry have clarified that the obsolescence refer to ammunition/rocket items in service use and not to technology of manufacture in the plant installed at OF which is a modern one employing latest technology and is capable of versatile production. The fact however remains that the facilities created at a cost of Rs. 20 crores have remained practically unutilised since January 1977. The Committee have been assured that with the increasing requirement of missiles the utilisation of the rocket propellant plant would be progressively stepped up. In regard to the ballistite plant, it has been decided to produce propellant for anti-tank ammunition. The Committee consider that the R/D efforts in this field need to be stepped up considerably. The Committee also urge that close coordination should be maintained between the producer, the users and the R&D so that the facilities set up at a huge cost can be made full use of in the interest of the country's defence preparedness.

1.75 The Committee find that one of the two units of ancillary plant including the building and certain material costing Rs. 28.60 lakhs were destroyed during commissioning trial in an explosion in May 1975. The Plant at the time was being operated by the supplier's representative. The accident was investigated by the plant designer who concluded that it happened as a cumulative effect of 5 or 6 technical reasons for which no particular person or party could be held responsible. An amount of Rs. 26.33 lakhs is stated to have been reimbursed by the insurance company. The Committee have been informed that the safety measures recommended in the investigation report have been implemented. Considering the extreme climatic conditions in the area, the Committee hope that adequate precautions will henceforth be taken while operating the plant.

1.76 In conclusion, the Committee would like to point out that the Ordnance Factory is a typical example of a defence production unit continuing to function on the basis of outdated technology and with obsolete plant and equipment. In order to keep pace with the growing requirements of sophisticated arms, ammunition and other equipment, it is essential that a perspective plan is prepared for replacement of old plant and equipment in the ordnance factories with modern ones based on latest technology. The Committee would like to be apprised of the steps taken or contemplated in this direction.

NEW DELHI :
April 24, 1982

Vaisakha 4, 1904 (S)

SATISH AGARWAL
Chairman
Public Accounts Committee

APPENDIX I

(vide Para 1.9)

CAPACITY UTILISATION OF PROCESS PLANTS

Plant	Installed	Quantities produced (In tonnes)			
		(Percentage of capacity utilisation)			
	Tonnes p.a.	Year 1979-80	Year 1980-81	Year 1981-82 Target	Future Projection
P	780	331 (42%)	315 (40%)	405 (51%)	645 (82%)
Q	1083	71 (7%)	214 (20%)	700 (65%)	1020 (94%)
R	888	191 (21%)	312 (35%)	130 (15%)	495 (56%)
SULPHURIC ACID / OLEUM	10080	4241 (42%)	4768 (47%)	5330 (53%)	6500 (64%)
NITRIC ACID	6120	401 (7%)	3180 (52%)	3730 (61%)	4470 (73%)

APPENDIX II

STATEMENT OF CONCLUSIONS AND RECOMMENDATIONS

Sl. No.	Para No.	Ministry/Department Concerned	Conclusion/Recommendation
1	2	3	4
1	1-60	Department of Defence Production	The audit para refers to the continued under-utilisation of the production capacity in various plants of an Ordnance Factory, which manufactures certain types of explosives for the army. The Public Accounts Committee (1972-73) in their 92nd Report on the subject had recommended that efforts should be made to bring down the cost of production of process material 'X' required for the manufacture of explosive 'A'; there should be no delay in establishing the required variety of explosive 'B' for a particular ammunition after 1974 and that the process material plant for explosive 'C' should be fully utilised. The Committee regret to note from a review in Audit in February 1980 of the performance of the factory that none of the recommendations of the Committee have been adequately implemented. The Committee have been informed that although it has not been possible for various reasons to optimise the production on lines recommended by the Public Accounts Committee, the requirements of explosives had been fully met till 1977-78 when there was a sudden spurt in the demand and imports had to be resorted to.
2.	1-61	Do.	The Committee find that the actual production of the plant for production of explosive 'A' during the period 1974-75 to 1980-81 has fluctuated between 158 to 600 tonnes as against the established capacity of 660 tonnes per year. The production is, however, stated to have gone up since 1978-79 and the average during the four years ending 1981-82 was of the order of about 554 tonnes.
3.	1-62	Do.	The Committee were informed that the Plant which was of 1937 vintage had been in use in the supplier country (UK.) for 5 to 6 years and that its residual life was 6 to 7 years when it was installed in 1965. During the years 1977-78, 1978-79 and 1979-80, the cost of repairs amounted to Rs. 17.76 lakhs and the down-time was as high as 22%, 26% and 23% in the respective years. Additional replacements under consideration would involve an expenditure of Rs. 8 lakhs during the next two years and ensure a sustained production of 550-600 tonnes of explosives per year. The Committee consider that the economics of working of the plant which has now outlived its useful life, should be carefully examined in the context of the decision to set up a new plant at another place before incurring any further expenditure on its re-conditioning.
4.	1-63	Do.	The Committee find that since there was no captive plant for production of calcium carbide which was the basic raw material for manufacture of explosive

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			<p>'A', the same had to be obtained from as far as Kerala and Tamilnadu. Apart from the cost of transportation being high, the chemical composition deteriorated fast due to ingress of moisture during transit and during storage with the result that the finished material was of poor quality. The Committee consider it very unfortunate that such a situation has been allowed to linger on over the years without any thought having been given to get over the problem. The Committee are greatly concerned that the factory has been producing sub-standard explosives for the army. The situation needs to be remedied without delay. The Committee would like to be apprised of the steps proposed to be taken in the matter.</p>
5.	1-64	Department of Defence Production	<p>The Committee find that against the total requirements of 3897 MT of Explosive 'A' during the four years 1978-79 to 1981-82, the production in the Ordnance Factory, during this period was only 2215 MT leaving a gap of 1682 MT (about 43%) which was met through imports (cost Rs. 6.56 crores till 1980). The Committee trust that with the coming up of a modern plant at another place based on latest technology, the increasing requirements of the Army as well as of civil users such as Coal India Ltd., will be fully met.</p>
6.	1-65	Do.	<p>For the manufacture of process material 'X', as against the capacity of 32.6 tonnes per month demonstrated by the foreign technicians by using imported material, the achievable capacity indicated on the basis of experimental trials conducted in August—September 1975 was 9.74 tonnes per month (117 tonnes per annum) sufficient to produce 160 tonnes of explosive 'A' per annum. The Committee, however, find that the total production of this process material during 4 years (1974-75 to 1977-78) was only 86 tonnes and none in 1978-79 and 1979-80 resulting in imports of the value of Rs. 2.09 crores. The very restricted production in earlier years and subsequent stoppage is attributed to scarcity of basic raw material for process material 'Y' from indigenous sources, the supply being 600 tonnes as against a requirement of 2000 tonnes per year. The Committee find that the cost of production in the factory was as high as Rs. 76,657 to Rs. 85,232 per tonne as against the cost of imported material varying from Rs. 4,069 to Rs. 11,777 per tonne. Fresh efforts towards improving the yield by carrying out modification of the plant have not met with success. Adoption of imported carbonation process technology suggested by National Chemical Laboratory Pune, at an estimated cost of Rs. 1.70 crores though expected to improve conversion efficiency would also not result in increased production of material 'X' due to increased time cycle. Moreover, the cost of production of the end product would be around Rs. 47,000 as against Rs. 11,777 per tonne of the imported variety. The trials using the carbonation process having failed, there is now no scope of manufacturing material 'X' economically thus rendering the investment on this plant infructuous.</p>

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7. 1-66	Department of Defence Production		The Committee understand that some private parties have offered to make the product subject to the condition that the plant is sold to them or leased out. The Committee would like to be apprised of the outcome of these efforts.
8. 1-67	Do.		Production of process material 'Y' which is the starting material for manufacture of process material 'X' declined sharply from 561 tonnes in 1974-75 to 43 tonnes in 1978-79 and 66 tonnes in 1979-80 as against the assessed capacity of 3780 tonnes per annum, the principal reasons being limited availability of basic raw material and abnormally high cost of production of process material 'X' from 'Y'. Although the basic raw material is now available indigenously, it is not proposed to procure the same as the production of process material 'X' from 'Y' is quite uneconomical. The plant is being operated to a small extent of 200 tonnes per year to meet the non-defence requirements. As such limited production is bound to be very uneconomical and the factory itself has no use for this plant, the Committee consider that the same should be disposed or or leased out to some public or private undertaking which can utilise it better.
9. 1-68	Do.		The production of explosive 'B' is equally unsatisfactory. As against the installed capacity of 810 tonnes the production was only 400 tonnes in 1978-79 and 335 tonnes in 1979-80. Since the plant for production of this explosive had not been working to the rated capacity, it was proposed to produce a different variety of explosive which was still under development. The Committee find that despite the fact that development trials for the manufacture of the specified variety of the explosive 'B' have been going on since 1971-72, it has not been possible to establish production thereof on a sustained basis. The expenditure of Rs. 4.37 lakhs so far incurred on the development effort has thus yielded no results. The Committee have been given to understand that as a result of a review of different specifications for the weapon undertaken recently by the AHSP in consultation with the users and producers, it has been possible to make them agree to certain changes and rationalisation in specifications.
10. 1-69	Do.		In their 92nd Report (Fifth Lok Sabha), the Committee had drawn attention as early as in 1972-73 to the need for establishing the production of the required variety of explosive 'B' so as to ensure better utilisation of the available capacity. The Committee consider it unfortunate that no progress could be made in this regard even over a period of 10 years. The Committee expect that with the rationalisation now agreed upon by the users, all efforts would be made to utilise the available capacity to the optimum level.
11. 1-70	Do.		The Committee find that the production of process material 'H' which is the input for the plant for explosive 'C' fluctuated between 192 tonnes to 352 tonnes during 1974-75 to 1979-80 as against the

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			<p>realisable capacity of 1,284 tonnes. The shortfall is attributed to restricted production to keep pace with the requirement of explosive 'C' and also due to the fact that the demand for the item from the civil trade was low. The Committee have been informed that the number of items of the finished stores requiring explosive 'C' has come down from 21 in 1957-58 to only 7 at present. However, the Ordnance factory is stated to be one of the eight producers in the world possessing the production capability for explosive 'C' which is far superior in performance as high explosive when compared to TNT and hence it is a national asset for defence preparedness. The Committee find that the Armed Forces have indicated demand for a new low temperature plastic explosive. This facility when set up will require explosive 'C'. The R & D is designing a new series of propellant which when developed and introduced would also call for substantial quantities of explosive 'C' and hence process material 'H'. The Committee expect that efforts in this direction will be pursued with vigour. They would like to be informed of the progress made and the results achieved.</p>
12.	1-71	Department of Defence Production	<p>The Committee find from the statement given in Appendix I that the utilisation of sulphuric acid plant was as low as 42% and 47% of the capacity during the years 1979-80 and 1980-81 while that of nitric acid plant was 7% and 52% in the respective years. This is stated to be a sequel to the under-utilisation of the main plants. Steps have been taken for increased utilisation by supplying to sister factories and trade and diversification of commercial explosive plant which would utilise the capacity of nitric acid and sulphuric acid plants to the extent of 1295 tonnes and 1340 tonnes <i>vis-a-vis</i> the installed capacity of the order of 6,120 tonnes and 10,080 tonnes respectively. The Committee desire that concerted efforts should be made to tap the market in the civil sector so that the capacity utilisation of these plants can be stepped up.</p>
13.	1-72	Do.	<p>The Committee understand that a project for creation of additional capacity for production of 1200 tonnes per annum of rocket propellants and ballistites was sanctioned in May 1969 at an estimated cost of Rs. 17.14 crores. There was considerable delay in the erection/commissioning of plants, the same having been taken over by the factory between January 1975 and December 1976 against the target date of May 1974 due to delay in completing the guarantee/versatility run of one plant. The estimated cost of the project had in the meantime (April 1972) increased to Rs. 20.034 crores.</p>
14.	1-73	Do.	<p>Apart from the delay, the performance of the plants has been much below the stipulated level. Out of the installed capacity of 720 tonnes for the propellants and 480 tonnes of ballistites, the actual quantities manufactured during the four years from 1976-77 to 1979-80, have ranged between 18 and 30 tonnes for the first item and 44 and 185 tonnes for the second one. The capacity utilisation has thus been as low as 2.5 to 4.1% and 9.2 to 38.5% respectively.</p>

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15.	1-74	Department of Defence Production	<p>The Committee are surprised to note that as against 28 items of ammunition/rockets indicated as the likely requirements, actual orders cover only a few items. In fact, two items of rockets which have since been withdrawn, account for a capacity of 624 tonnes against the total installed capacity of 720 tonnes while another item of end store requiring ballistites since withdrawn accounts for an annual capacity of 276 tonnes out of a total of 480 tonnes of ballistite capacity. Rest of the items are stated to have become either obsolescent or are still under development with Defence R & D. The Ministry have clarified that the obsolescence refers to ammunition/rocket items in service use and not to technology of manufacture in the plant installed at OF which is a modern one employing latest technology and is capable of versatile production. The fact however remains that the facilities created at a cost of Rs. 20 crores have remained practically unutilised since January 1977. The Committee have been assured that with the increasing requirement of missiles the utilisation of the rocket propellant plant would be progressively stepped up. In regard to the ballistite plant, it has been decided to produce propellant for anti-tank ammunition. The Committee consider that the R & D efforts in this field need to be stepped up considerably. The Committee also urge that close coordination should be maintained between the producer, the users and the R & D so that the facilities set up at a huge cost can be made full use of in the interest of the country's defence preparedness.</p>
16.	1-75	Do.	<p>The Committee find that one of the two units of ancillary plant including the building and certain material costing Rs. 28.60 lakhs were destroyed during commissioning trial in an explosion in May 1975. The Plant at that time was being operated by the supplier's representative. The accident was investigated by the plant designer who concluded that it happened as a cumulative effect of 5 or 6 technical reasons for which no particular person or party could be held responsible. An amount of Rs. 26.33 lakhs is stated to have been reimbursed by the insurance company. The Committee have been informed that the safety measures recommended in the investigation report have been implemented. Considering the extreme climatic conditions in the area, the Committee hope that adequate precautions will hence forth be taken while operating the plant.</p>
17.	1-76	Do.	<p>In conclusion, the Committee would like to point out that the Ordnance Factory is a typical example of a defence production unit continuing to function on the basis of outdated technology and with obsolete plant and equipment. In order to keep pace with the growing requirements of sophisticated arms, ammunition and other equipment, it is essential that a perspective plan is prepared for replacement of old plant and equipment in the ordnance factories with modern ones based on latest technology. The Committee would like to be apprised of the steps taken or contemplated in this direction.</p>

